Submittal information

1) Name, full address and telephone, fax and E-mail number for correspondence

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2) Reference of Topics for which your contribution is intended:

I am primarily hoping to discuss the contributions of the 2001 Odyssey Orbiter on behalf of the 2001 project. As such, the topics that are closest to what I would like to present are:

2. Geology and subsurface sounding

6. The place of NetLander in the Mars Exploration Program

3) Preference for oral or poster presentation:

Oral

THE 2001 MARS ODYSSEY ORBITER

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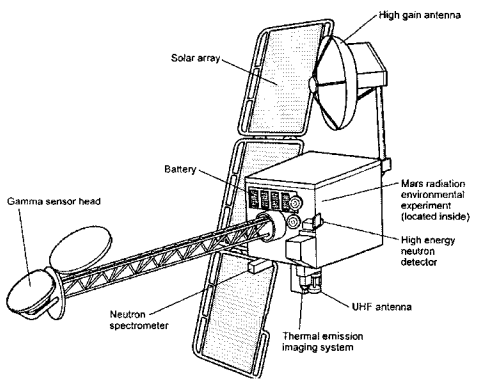

The 2001 Mars Odyssey mission will be an orbiting spacecraft designed to determine surface mineralogy and near surface elemental composition, create a global 20 meter/pixel image map, detect water and shallow buried ice, and study the radiation environment.

Mission Overview: On April 7, 2001, the Mars Odyssey is scheduled for launch on a Delta II vehicle from Cape Canaveral, Florida and will arrive at Mars in October 2001. After firing its main engine to slow itself enough to be captured by Mars' gravity, the orbiter will initially circle the planet once every 25 hours. Over the next 76 days, the spacecraft will use aerobraking to achieve a 2-hour 400 km circular science orbit.

Science Goals: The orbiter mission will globally map the elemental composition of the surface. In addition, determining the surface mineralogy and the abundance of hydrogen in the shallow subsurface are key goals. The orbiter will also provide information on the morphology of the Martian surface and about the geological processes that may have caused it. Finally, the orbiter will take important measurements of the planet's radiation environment that can be used to evaluate the potential health risks to future human explorers.

Science Instruments: The orbiter will carry three science experiments: The Thermal Emission Imaging System (THEMIS), the Gamma Ray Spectrometer (GRS), and the Mars Radiation Environment Experiment (MARIE).

THEMIS: The thermal emission imaging system will collect images that will be used to identify the minerals present in the soils and rocks at the surface. Minerals observed in the thermal infrared have distinct absorption features that allow them to be identified in false color images. The THEMIS system will support mineral mapping by the Thermal Emission Spectrometer (TES) instrument on the Mars Global Surveyor spacecraft —already at Mars—by observing the same infrared wavelengths at higher spatial resolutions. By looking in the visible wavelengths at the shape of the Martian landscape and determining the characteristics of rocks, dust, sand, and soils, the thermal emission imaging system will study small-scale geologic processes and landing site characteristics. The instrument will search for dry lakebeds as well as for temperature differences due to heat that may be coming from active volcanic areas or hot springs.

GRS: The GRS experiment is comprised of three related instruments, a Gamma Ray Spectrometer (GRS), a Neutron Spectrometer (NS), and a High Energy Neutron Detector (HEND). The GRS is sensitive to detecting elements such as potassium and chlorine, and it will be able to see if salts have been deposited in areas thought to be dry lake beds or ancient sea bottoms. The instrument will determine the abundance of major elements such as oxygen, iron, silicon, and aluminum. When compared to the solar ratio from which our solar system formed, the ratio of certain key elements (potassium and thorium) will tell us much about the planet's early history. By searching the planet for silicon-rich rocks, the spectrometer will provide key information about the composition and evolution of the Martian interior. The NS and HEND will be able to measure the amount of hydrogen in the upper meter of soil across the whole planet. Because the amount of water can be determined from the concentration of hydrogen, this measurement will help us understand how much water may be available for future explorations, as well as give us clues about the planet's climate history. The NS/HEND will also determine the thickness of the seasonal polar ice deposits as they grow and shrink each year.

MARIE: The radiation experiment will collect data on the radiation environment in space near Mars to help assess potential risks to future human explorers. The instrument consists of an energetic particle spectrometer that can measure the elemental energy spectra of charged particles.

Mars Communications Relay: The orbiter will also provide the capability store and relay data to Earth from future spacecraft that land on Mars, such as the 2003 rovers.

Project/Program Management: The 2001 Mars Odyssey is managed for NASA by the Jet Propulsion Laboratory; JPL's industrial partner is Lockheed Martin Astronautics. At NASA Headquarters, Mark Dahl is the 2001 Mars Odyssey program executive and Dr. Michael Meyer is the program scientist. At JPL, George Pace is the project manager and Dr. Stephen Saunders is the project scientist. Scientific instruments are operated by principal investigators from the University of Arizona (GRS), Arizona State University (THEMIS), and NASA's Johnson Space Center (MARIE).